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ABSTRACT

The traditional form of collaborative learning has been via face-to-face groups working together. The online forum can provide a different collaborative learning environment, due to its student-centric, asynchronous, written form. As a result of an investigation into the differences between face-to-face and online asynchronous communication, insights into the impact on collaborative learning emerged. This paper examines a subject that is presented using both face-to-face and asynchronous online forms of communication, discussing the differences in terms of collaborative learning. Data were collected through reflective reports written by the students, in-depth interviews with some students, videotaping of the face-to-face discussion, observations made by the lecturer, texts of the online discussions, and logs of the access to the online forum. Results are discussed in two main areas: differences between face-to-face and online communication, including synchronous versus asynchronous communication (immediate versus more considered response and permanency of content), written communication versus verbal communication (the medium of text and body language issues), and participation (the level and equity of participation); and group community and collaborative learning development, including the collaborative nature of the discussion, lecturer-centric versus student-centric discussion, nature of agreement, and extension of the learning community beyond the forum. (Contains 15 references.) (MES)

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STUDENT-CENTRED COLLABORATIVE LEARNING VIA FACE-TO-FACE AND ASYNCHRONOUS ONLINE COMMUNICATION: WHAT'S THE DIFFERENCE?

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Abstract

The traditional form of collaborative learning has been via face-to-face groups working together. The on-line forum can provide a different collaborative learning environment, due to its student-centric, asynchronous, written form. As a result of an investigation into the differences between face-to-face and online asynchronous communication, insights into the impact on collaborative learning emerged. This paper examines a subject that is presented using both face-to-face and asynchronous online forms of communication, discussing the differences in terms of collaborative learning.

Keywords

collaborative learning, online forum, communication

Introduction

Student-centred learning implies a "need for students to assume a high level of responsibility in the learning situation and be actively choosing their goals and managing their learning. They can no longer rely on the lecturer to tell them what, how, where and when to think. They must start to do this" (Sparrow, Sparrow & Swan, 2000). Collaborative learning environments with emphasis on process, rather than product, engender this type of interactive learning (Salmon, 2000; Ch.2). The traditional form of such collaborative learning has been via face-to-face groups working together. The online forum can provide a different collaborative learning environment, due to its student-centric, asynchronous, written form.

Structure of the Subject

Subject Details

A new subject titled "Issues for Human Communication Across the Internet" was introduced into the Bachelor of Network Computing as a third year elective in the second semester of 2000. The subject addressed issues arising from the use of the Internet as a source of human communication. It explored how human communication occurs, and investigated the Internet as a human communications medium, with particular emphasis on the World Wide Web. Students were required to critically analyse and evaluate issues that related to the Internet as a human communications medium (e.g. intellectual property rights, piracy, equity, ethics, privacy, online identity). The students looked at how the Web is used to communicate and present information for a variety of uses (e.g. electronic commerce, marketing, entertainment, education), and the various media forms that support this. Twenty-two students enrolled in the subject, with one student withdrawing from the subject during the semester. All students were studying computing, either as a single degree or as part of a double degree.

The philosophy behind the subject was that of building a collaborative learning environment with the students finding information themselves, evaluating and critically analysing the information,

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discussing it with one another, building structured arguments and drawing conclusions about the various topics under discussion. It used a constructivist approach, one of "learning as an active process rather than a result of transmission of knowledge from program to student" (Herrington & Standon, 2000). The main role of the lecturer was that of a facilitator.

The delivery of the subject was achieved in two forms - through face-to-face small classes and via an asynchronous online discussion forum, with the two forms covering different content areas.

Face-to-Face Classes

Each face-to-face class ran as a two-hour session once per week. The topics covered human communication, evaluation of information on the Web, the Internet as a communications medium and the use of different media forms for Web communication. Each class had 11 students.

Classes had information provided by the lecturer (this was in various forms; video and audio tapes, content from books and articles, material from the Web) and contributions from the students (usually Web sites) that illustrated the content being discussed. The students participated in discussion relating to this information and various activities to reinforce the information or promote further discussion. Discussions occurred in both small groups (three or four students) and the whole class group (lecturer included).

Online Forum

Software used for the online forum

The conferencing facility used for the online forum was Web-Board (ChatSpace, Inc.), a Web accessible conferencing forum (a web-board) with multiple conferences within that forum. The subject web-board was restricted to enrolled students and only the asynchronous medium was used.

Functional structure of the web-board

The Web-board provided a number of functions as follows:

- To provide a repository for up-to-date subject information. Three conferences were established: a "Subject Details" conference provided by the lecturer, a "Messages" conference used by students and the lecturer to post messages about the subject and a "Questions" conference where students could ask questions relating to the subject.
- To provide a set of references for the subject built by the students (about 95%) and the lecturer (5%). Students were encouraged to share interesting sites that related to all aspects of the subject topics, including those explored in the face-to-face classes. Twenty-six sites were contributed from more than half the class members.
  Students found these links useful as evidenced by the following comments:
  "I made use of these links regularly to reinforce ideas discussed during class times, to expand my knowledge and in some cases to apply what I had learnt or my ideas to a practical situation."[student 1]
  "The Interesting URL's section was again a section I used thoroughly, checking out what other people look at when researching the subject." [student 2]
- To provide a photo and personal details (contributed by the student) of each student in the class. As there were two face-to-face classes, students encountered others in the online forum they hadn't met face-to-face. This was done as part of the topic "communication of self" and as a mechanism for students to meet within the online forum. One student commented:
  "The actual student details part on the web page was interesting in finding out what other student's personalities are like. By reading through each person's profiles, I could get a better understanding of each student. This helped in the understanding of the messages and opinions each individual posted on the discussion forum." [student 2]
- To provide an online forum for discussing the issues relating to human communication across the Internet. This was the main function of the web-board. Four separate forums were run:
  - Intellectual property rights and piracy
  - Ethics, censorship, privacy and freedom of speech
  - Online identity
  - Equity

Running the discussion forums

The discussion forum on "Intellectual property rights and piracy" had a number of readings specified. A discussion was started by posing questions related to the readings and presenting a current case study on the topic centered on the organisation Napster.

For the forum on "Ethics, censorship, privacy and freedom of speech ethics" readings were also specified. Two threads for discussion were started by an audio tape of a radio broadcast that covered two current cases. These were "The responsibility of an ISP to ensure information posted is not libelous", and "The ethics of publishing information that can be used for unethical purposes and to pervert the course of justice (i.e. the Crimenet site)".

The discussion forum on "online identity" had readings embedded in the opening message that posed a number of points for discussion. An activity relating to online identity and deception was also posted.

The "Equity" forum was commenced through an activity that required the students to respond with answers online. These were summarised and a second activity for students to participate in was spawned as a subsequent part of the exploration of the issue.

Data Collection

Data comparing face-to-face with on-line communication was collected through reflective reports written by the students, a number of in-depth interviews with some students, videotaping of the face-to-face discussion, observations made by the lecturer, texts of the online discussions and logs of the access to the online forum

Results

Initially, the purpose of this investigation was to examine the differences between face-to-face communication and online asynchronous communication to improve communication in the online forum and subsequently provide a better learning environment. As a result of observations made, issues relating to collaborative learning emerged. The results summarised here attempt to highlight the differences between the two forms of communication and their impact on collaborative learning.

Student Insights

Despite students studying a computing degree and having extensive familiarity with email and the Web, most students had little, if any, experience in using online discussion forums. Half the students (10 of 21) recognised that the forum was a place for collaborative learning and that one only got out of it what one put in.

Advantages of the online forum

Table 1 lists the advantages of the forum given by the students, with flexibility of access being considered the greatest advantage. Students found this flexibility useful for both the discussion and accessing up-to-date subject information. This is consistent with other researchers who also found indications of similar advantages in flexibility (Tiene, 2000; Barnes, 2000).

Advantage	Number of responses
It is convenient in time and place	16
It is more equitable – especially for quieter students – more students participate	14
Details of the discussion remain. One can backtrack and reread a message	9
Allows the more reflective thinking student to participate more	7
The asynchronous nature allows for a more considered response	7
The lecturer is seen as a moderator rather than a teacher	4
It allowed for discussion with students from other class groups	3
The lecturer becomes just one of the group in discussion	3
More freedom and more likely to express opinions and comment on other's remarks	3
It is possible to choose what to participate in and one can multitask	2

Table 1: Advantages of online over face-to-face discussion listed by students

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Disadvantages of the online forum

Disadvantages of the online forum listed by students were mainly to do with the lack of immediacy of response and lack of the interactive features of conversation that caused the forum discussion to be more constrained (see Table 2). About 25% of the students felt that too much opinion was expressed (posting only from existing knowledge) rather than structured analysis and research, and that a student's written English skills may influence their participation.

Disadvantage	Number of responses
It wasn't possible to read face-to-face nuances such as body language	10
Took away the features of conversation (e.g. immediacy of response, interactivity)	7
It was difficult to get an indication of depth of feeling or a person's response	4
Some students relied on others to post - only ? contributed in any one discussion	4
Discussion threading can become confused, allowing discussion to go off-track	3
There was a tendency not to post when in agreement	3
It is possible to opt out of the discussion, and the extended time for the discussion delays conclusions being reached or causes the topic to go off track	2

Table 2: Disadvantages of online forum listed by students

Lecturer Insights

As seen in many undergraduate courses, there were inevitably some students who were assessment driven and only posted messages for assessment purposes. Others, however, were very active. It was gratifying to see one student shifting from being assessment driven to recognising the value of the forum as a collaborative learning environment, as can be seen by the comment below.

> "I have found that there are two ways you could approach the discussion forum. You could hit it head on and make it an assessment activity where you had to post messages to gain a pass, or you could make the forum into a helping hand to the subject. ... The discussion forum can be used to your benefit by taking out what you give. If you are willing to help other people then they will help you."[student 2]

The lecturer found that prompting for responses in the online forum was more difficult. Often questions were posed through the forum that received no response, and requests for contribution did not elicit an increase in postings. Despite this, some students contributed online who did not contribute voluntarily to class discussion. It was harder to motivate students to participate. Even directly emailing the student had minimal impact. At times it was difficult to keep the online discussion on track, perhaps because the lecturer was not seen as the controller of the discussion and students were inexperienced with threaded discussion forums.

Differences Between Face-to-Face and Online Communication

Synchronous versus Asynchronous Communication

Nature of response - immediate versus more considered response

The asynchronous nature of online forums lacks the immediacy of conversation, yet has the advantage of allowing a more considered response. Seven students (33%) saw the lack of immediacy of response and synchronous interactivity as a disadvantage. One student commented:

> "...being unable to get immediate feedback presented a problem....In normal discussion it is possible to ask questions in order to get a better understanding of the issue and get an immediate response."[student1]

Conversely, seven students saw the asynchronous nature of the forum allowing a more considered response to be an advantage. While some students' comments were quite spontaneous, for the most part responses in the asynchronous medium tended to be more considered than for the face-to-face discussion.

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"This communication medium also allows students to think about the discussion and research the topic before contributing to the forum, thus providing the group with a more relevant and knowledgeable response. I believe that students hate nothing more than answering a question in class and getting it wrong it is far safer to sit and say nothing." [student 3]

"Another reason why I contribute [to the online forum] is because I can compose my thoughts and concepts before answering or posting a new topic." [student 8]

Permanency of content

Nine students indicated the permanency of content was an advantage, in that one didn't miss part of the conversation, and one could reflect at leisure.

"One other thing is that the messages remain in the board where you can access it again and again if you forgot some of the points raised for those issues." [student 4]

"It is good as you can keep up with the conversation if you have missed a portion."[student 7]

There was a sense that permanency also had some disadvantage, with two students commenting that this might be a deterrent to people being more active in their posting.

"I think perhaps the reluctance to use the board was partly to do with the permanence and openness of the board." [student 1]

"However, this [permanency of content] may put some people off because of the fact that the messages are stored. ... [in face-to-face] even if you had said something wrong or offensive; you can always "take it back". With the online forum, you cannot do this." [student 11]

As students could remove their own messages at any time, lack of activity in discussion may have been due more to apathy or lack of willingness to explore the topic more fully than a concern about permanency.

Written Communication versus Verbal Communication

The medium of text

The medium of text did not appear to inhibit the students' use of the forum, perhaps due to students' familiarity with online communication via email. One student described the communication as "say-writing - a cross between writing and speech." She said

"This form of communication is easy to understand, and through the use of symbols to replace the lack of physical cues, students made their best efforts to communicate effectively."[student 3]

Body language issues

By contrast, half the students considered lack of both body language and the ability to accurately assess emotion a disadvantage. The following comments were common.

"... it can be difficult to assume the manner or tone of the conversation from one member to another, to assume sarcasm and the like, without any face-to-face contact." [student 7]

" ... the lack of facial and bodily expressions can contribute to limiting the effectiveness of the communication that is taking place."[student 3]

"... one of the disadvantages of online discussion is that emotion is difficult to convey in writing." [student 5]

Participation

Level of participation

On analyzing the discussions it was apparent that contribution and activity increased as the semester progressed (see Table 3).

Start date of discussion	Discussion	Student postings	Number of students contributing	Number and type of postings by lecturer
24.7.2001	Intellectual property rights and piracy	17	11	9 – 2 to set up topic, 1 to set up case study, 1 to clarify, 1 to request summary, 4 to contribute
8.8.2001	Ethics, censorship freedom of speech	20	11	9 – 2 to set up topic, 2 to set up 2 case studies, 1 to pose a further question, 4 to contribute
23.8.2001	Online identity	21	12	6 – 2 to set up topic, 1 to provide reference, 1 to extend discussion, 2 to contribute
11.9.2001	Equity	22	13	8 – 2 to set up topic, 1 to clarify, 2 to summarise, 1 to curb smart remark, 2 to contribute

Table 3. Postings contribution of students and lecturer by discussion forum

Seventeen of the 21 students contributed to the forums. From the logs, all students visited the web-board to read postings, although the frequency of access varied. Level of motivation, interest in the discussion and the flexible nature of the online forum and there being no formal prompt to access the forum is likely to have causes this.

"Having to have access to the Internet and check the site as frequently as we should have became what was sometimes a forgetful activity."[student 2]

"Behaviour, willingness, interest and time management issues appear to affect participation." [student 5]

Equity of participation

Fourteen students (66%) considered the equity of participation to be an advantage with some students giving considered and articulate responses despite no class contribution.

"The discussion forum does however encourage an equal level of participation than face to face conversation. ... it got most people involved, even those people whom were reluctant to put their opinions across during class." [student 1]

"... whereas in face-to-face communication, sometimes one person can dominate the whole conversation without giving the others opportunities to speak out their opinions." [student 4]

An interesting feature was that some students thought the impersonal nature of the forum encouraged responses not likely to be expressed face-to-face.

"The downfall of the increased confidence the web board might give people is that people can also be a lot more forthright with their responses."[student 13]

"... I was amazed to see how many others were against my way of thinking. I thought that my responses were just, but obviously others had different opinions."[student 12] (This last comment was from a student who was very reserved in class yet had expressed his opinions and beliefs quite strongly in the online forum.)

This agrees with Lewis, Treves and Shaindlin (1997; p.98), who found student comments to be "more opinionated and questioning, openly inviting exchange and healthy confrontation."

Group Community and Collaborative Learning Development

Collaborative Nature of the Discussion

"In order for collaborative online learning to take place successfully, it is crucial that the learner feels part of a learning community where his/her contributions add to a common knowledge pool and where a community spirit is fostered through social interactions" (Bernard, Rojo de Rubalcava, St-Pierre, 2000, p.262).

Students recognised the online forum was about collaborative learning, as evidenced by these comments.

"However, it's not just about sharing what *you know*, it also involves learning about what you don't know."[student 6]

"I used it [the online discussion forum] more if I had an assessable task in which I needed clarification through the varying opinions and ideas suggested through the discussion at hand." [student 7]

The students did respond to one another's postings and actively discuss points, however the discussion often appeared disjointed, with points being made in isolation from others and questions posed that were never answered. The exception was the discussion relating to online identity; perhaps because students had more interest in the topic area and more personal experience of this phenomenon. This was partly due to the students' inexperience with threaded discussion that caused messages to be attached inappropriately to a particular thread of the discussion, making it difficult to follow. In hindsight, training in the use of a threaded discussion is needed.

Most discussion was generated from the student's existing knowledge rather than from further research. Conflicting responses about the depth of response in discussion occurred. Some students felt the discussion was more in depth than the face-to-face discussion -

"I found the discussions on the web board would go into a lot more depth than those experienced in face to face discussion in class."[student 13]

"If the topic really interests me, I will even go into research for that topic." [student 8]

while others felt the discussion tended to be superficial.

"The comments made on the discussion forum were generally statements of opinion, and these opinions were not well formulated."[student 1]

"... the opinions they give would be very much self centred (including me), rather than to discuss rationally about the issues". [student 3]

These latter comments coincided with the lecturer's observation that student's skills of analysis and evaluation are often poorly developed, an observation borne out by the examination results. In hindsight that more specific activities to develop these skills are needed. Reliance on the discussion alone to develop such skills is not sufficient.

Despite this, students felt the discussion opened up other possibilities for them, or gave them insights they might not have had.

"Other students have used the board as the place to post their views on the issues that I would not have thought of before."[student 4]

"The online discussion forum enabled me to read other peoples ideas, respond and reevaluate my opinion. This broadened my knowledge of the issue and helped me to better understand the issue beyond what I already knew thus constructing knowledge." [student 1]

"When you read what the others have to say, their ideas and concepts become clear and you see a bigger picture."[student 6]

These comments support Bruffee's definition of collaborative learning as "a reculturative process that helps students become members of knowledge communities whose common property is different from the common property of the knowledge communities they already belong to" (Bruffee, 1993, p.3 as cited in Koschmann, 1996, p.13).

There did not seem to be a sense of reaching a conclusion about the discussion as a group, or a sense of group consensus, that would eventuate for small group discussion in the face-to-face classes. While discussion forums were started on a specific date, no fixed length of time for a discussion to run was specified, and only limited summing up was done. This caused a "petering out" of discussion. Three changes might have achieved better consensus; a fixed length of time for the discussion to run, better summing up during the forum and having students work in small groups online to present a group comment.

Lecturer-centric versus Student-centric Discussion

As has been shown in other research (Lewis, Treves & Shaindlin, 1997), seven of the students felt the online forum was less lecturer-centric than the face-to-face discussion. Perhaps this is because "online learning offers participants opportunities to explore information rather than asking them to accept what the teacher determines should be learnt" (Salmon, 2000 p.39)

> "The use of the forum changed the standard teacher guided focus of the subject that students usually expect. Although the lecturer initially introduced each topic, there was much student to student interaction."[student 3]

Observations of the face-to-face sessions showed that when the discussion group included the lecturer, the discussion was directed through the lecturer. It was as if the lecturer's physical presence caused the students to perceive the lecturer as in control. This disappeared within the online forum and students freely commented directly to one another. An analysis of the web-board content shows that the lecturer's contribution to the actual discussion, as distinct from moderator postings, was less than half the total number of postings by the lecturer (see Table 3 - column labelled "Number by lecturer").

Nature of Agreement

In a face-to-face discussion agreement is gained from the group by such things as nodding one's head and murmurs of agreement. It is possible to "actively participate without making a verbal contribution" (Barnes, 2000; p.240). This was missing from the online discussion. Students thought it redundant to post a message saying "I agree", therefore awareness of the group sense only came from those actively participating.

> "Many of the times when I had logged on there was always one student who had posted a message with exactly the same content as I would have had, this is probably why I did not post as many messages as other people." [student 10]
>
> "In normal conversation you would hear the reiteration of information presented by others." [student 1]

In the online forum, as people tend not to post to voice agreement with a comment, it is almost impossible to gauge whether others are silent because of agreement or because of a lack of willingness to post. Hence the discussion sometimes became forced.

> "My experiences on the use of the online forum and other people's use on it is that most people needed to be prompted with a negative opinion before they answer, or a contrary outlook, so that it can be countered or the idea can be enhanced through more ideas.... It seemed at times that only a few people were actively participating in discussion ..."[student 7]
>
> "I know that I have not been active in the discussion. ... But this is also because most of the things that I can think of about certain issues are already posted and basically the idea that I have is the same as what others had posted." [student 4]

Extension of the Learning Community Beyond the Forum

Despite the forum being run as one large group, the students did form their own learning communities to study and assist one another with assignments. The assignment work was very individual and all students chose quite different topics to present. The exam content showed a number of quite distinct study groups that had developed. Brandon and Hollingshead (1999) cite a number of researchers who have indicated that computer supported collaborative learning is beneficial (Alavi, 1994; Harasim, 1991; Hooper, 1992; King, 1994 as cited in Brandon & Hollingshead, 1999). It is difficult to know whether collaboration is directly attributable to the online forum or the nature of the subject, but previous experience with other subjects (even those with group assignments) did not appear to produce the same sense of community.

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Conclusion

The students were enthusiastic about their experience of the online forum and felt it was an appropriate medium for this subject. The incorporation of the online forum where subject content was covered that was not discussed elsewhere encouraged greater use of the online forum than has been seen for other mixed mode subjects. The students saw advantages in the asynchronous written nature of the online forum, yet found face-to-face exchanges a more natural form of communication. It would appear that the student-centric nature of the online forum encouraged a collaborative approach to learning, and a subsequent natural development of collaboration outside the online environment. However, more research is needed to determine if this is directly attributable to the online forum rather than the nature of the subject itself.

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